

WHAT IS CLAIMED IS

1. A transformed cereal plant seed, the endosperm of which is characterized as having an elevated level of at least one preselected amino acid compared to a seed from a corresponding plant which has not been transformed, wherein the amino acid is lysine, cysteine, threonine, tryptophan, arginine, valine, leucine, isoleucine, histidine or combinations thereof and optionally methionine.
2. The seed according to claim 1 wherein the preselected amino acid is lysine, threonine or tryptophan and optionally a sulfur-containing amino acid.
3. The seed according to Claim 2 wherein the preselected amino acid is lysine.
4. The seed according to Claim 3 wherein the preselected amino acid is lysine and a sulfur-containing amino acid.
5. The seed according to Claim 1 wherein the plant is selected from the group consisting of maize, wheat, rice, barley, oats, sorghum, millet and rye.
6. The seed according to Claim 5 which is a maize seed.
7. The seed according to Claim 1 wherein the plant expresses a transgenic protein having an elevated level of the preselected amino acid.
8. The seed according to Claim 7 wherein the protein is barley chymotrypsin inhibitor, barley alpha hordothionin, soybean 2S albumin protein, rice high methionine protein, sunflower high methionine protein or derivatives of each protein.
9. The seed according to Claim 1 wherein the amount of preselected amino acid in the seed is increased at least about 10 percent by weight compared to a corresponding seed which has not been transformed.

10. The seed according to Claim 9 wherein the amount of the preselected amino acid in the seed is about 10 percent by weight to about 10 times greater compared to a corresponding seed which has not been transformed.
- 5 11. The seed according to Claim 10 wherein the amount of the preselected amino acid in the seed is about 15 percent by weight to about 10 times greater compared to a corresponding seed which has not been transformed.
12. The seed according to Claim 11 wherein the amount of the preselected amino acid in the seed is about 20 percent by weight to about 10 times greater compared to a corresponding seed which has not been transformed.
- 10 13. An expression cassette comprising a seed endosperm-preferred promoter operably linked to a structural gene encoding a polypeptide elevated in content of a preselected amino acid.
14. The cassette according to Claim 13 wherein the promoter is a gamma zein promoter or a waxy promoter.
- 15 15. A vector comprising the expression cassette of Claim 13.
16. A plant cell transformed with the vector of Claim 15.
17. A transformed plant comprising the vector of Claim 15.
18. A seed product obtainable from the transformed seed of Claim 1.
19. A seed from a cereal plant which has been transformed to express a heterologous protein in the endosperm of the seed, wherein the seed exhibits an elevated level of an essential amino acid compared to a plant which has not been transformed.
- 20 20. A method for increasing the nutritional value of a cereal plant seed comprising: transforming a host plant cell with a vector comprising an

expression cassette comprising a seed endosperm-preferred promoter operably linked to a structural gene encoding a polypeptide elevated in content of a preselected amino acid; recovering the transformed cells; regenerating a transformed plant; and recovering the seeds therefrom.

- 5 21. A seed produced by the method of claim 20.

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